New Technologies for Emerging Threats: Virtual Community Evaluation Complex

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VCEC: The Need

Issue…

- Emergence of new threats to the national infrastructure and the need for innovative ways to combat them.

Need…

- The establishment of a framework and test-bed for developing and evaluating technologies critical to effectively combating such emergent threats.

VCEC: Target Solution

Challenge…

- Combating threats such as Terrorism, WMD Attacks, Narcoterrorism, attacks on Military Forces, and attacks on Critical Infrastructure.

Solution Approach…

- Leverage DoD installations and their RDT&E missions to create a test-bed for developing and evaluating technologies.
- Assess interoperability across systems and mission domains
- Offer ROI to DoD by improving infrastructure protection and monitoring capabilities.

Infrastructure Protection and Monitoring

Needs …

- Combat risks of terrorism
- Detect chemical and biological agents
- Improve consequence management
- Integrate early warning capabilities
- Improve physical & electronic security
- Network critical infrastructure

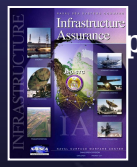
Infrastructure Protection and Monitoring

DoD Benefits…

- Protect critical infrastructure
- Optimize utilities & services
- Maximize staff efficiencies
- Improve real-time situational awareness
  - monitor, alert and control

Mission Assurance Solutions & Innovative Technologies

SYSTEMS ENGINEERING & TECHNOLOGY



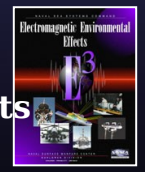
Joint Program Office for Special Technology Countermeasures
(JPO-STC)

Infrastructure Assurance

Special Technology Counter Measures

Naval Operations Other Than War Technology Center
(NOOTW-TC)

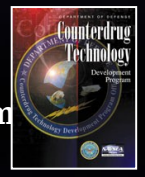
Electromagnetic Environmental Effects
(E^3)

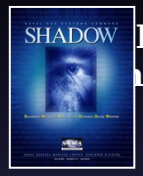


Joint Non-Lethal Weapons Directorate
(JNLWD)

National Innovative Technologies
NITMAC
Mission Assurance Center

Counterdrug Technology Program
(*CDTPO*)



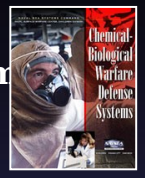


Intrusion Detection Information Assurance
(IDIA)

Special Acquisition Programs

Center for Coastal & Marine Security (CCMS)

Chemical-Biological Warfare Defense Systems



Tenant Commands

Joint Warfare Analysis Center
(JWAC)

Naval Network & Space Operations Command

FULL SPECTRUM ACQUISITION

Program Sponsor

- DoD Counterdrug Technology Development Program

Charter

- Development and Demonstration of technologies, and specific counterdrug system solutions to enhance the counterdrug capabilities of the Department of Defense and as appropriate, Civilian Drug Law Enforcement Agencies, while remaining consistent with the National Drug Control Strategy's Goals Four and Five.

The Dahlgren Division Team

NAVSEA DAHLGREN Surface Warfare Center Division

VCEC Program Management and R&D Lead

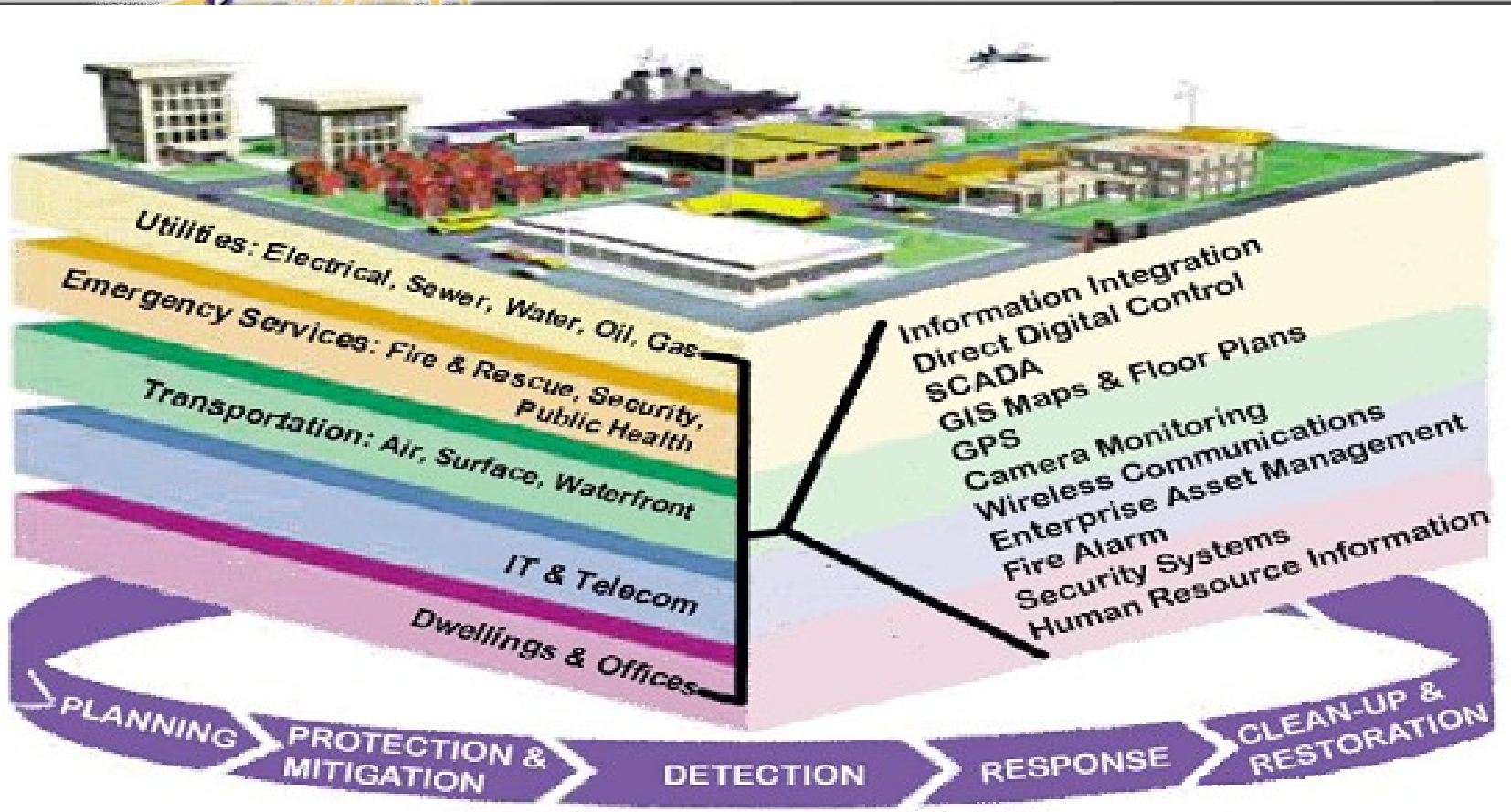
NAVSEA PANAMA CITY Coastal Systems Station

Coastal & Maritime Security Technology Lead

3e Technologies International

VCEC Lead Technology & Systems Integrator
($40M Phase III SBIR Contract)

Dahlgren Test-Bed



Virtual Community Evaluation Complex (VCEC)

Improving Military Base Operations & Force Prote

Test-Bed Users

- Counterdrug Technology Development Program Office (CTDPO)
- Defense Threat Reduction Agency (DTRA)
- Other military installations actively considering employment of VCEC technologies
  - Naval Surface Warfare Center Indian Head
  - Fort Bragg, North Carolina
  - Naval Surface Warfare Center Dahlgren Division Coastal Systems Station

U. S. Navy NSWC Dahlgren

LAND: 4,320 Acres
BUILDINGS: 644
HOUSING UNITS: 250
PLANT REPLACEMENT VALUE: $ 555 M

SENSOR SYSTEMS:

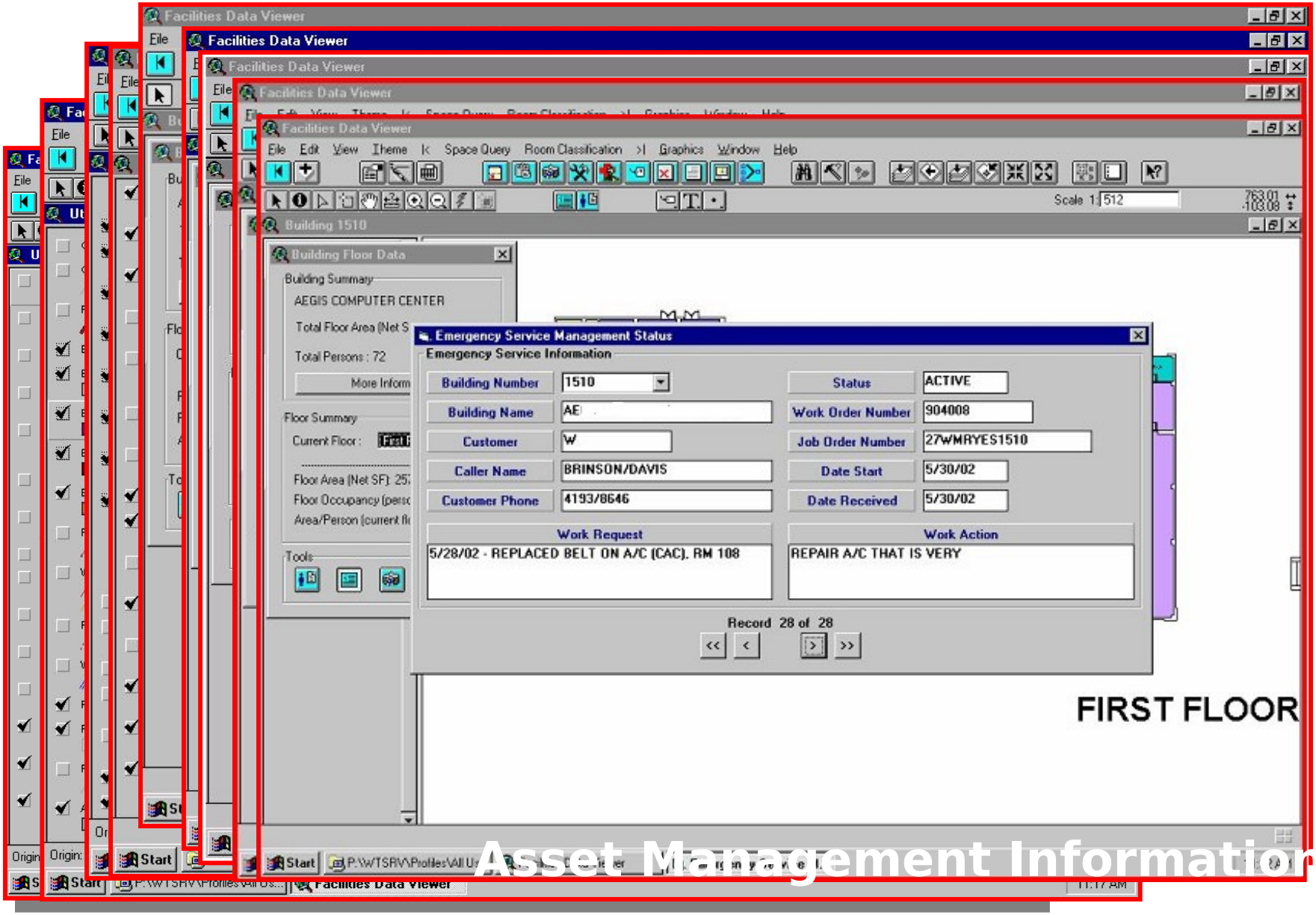
DDC/SCADA	60,000 Sensors
CAMERA SYSTEMS	30
FIRE ALARM SYSTEM	137 Buildings
FIBER OPTIC NETWORK	31 Miles
SECURITY SYSTEMS	40 Buildings
WEATHER SYS/RADAR	
CHEM/BIO	> 10

INTEGRATED GIS ENVIRONMENT:

Linked databases on a common geospatially referenced map

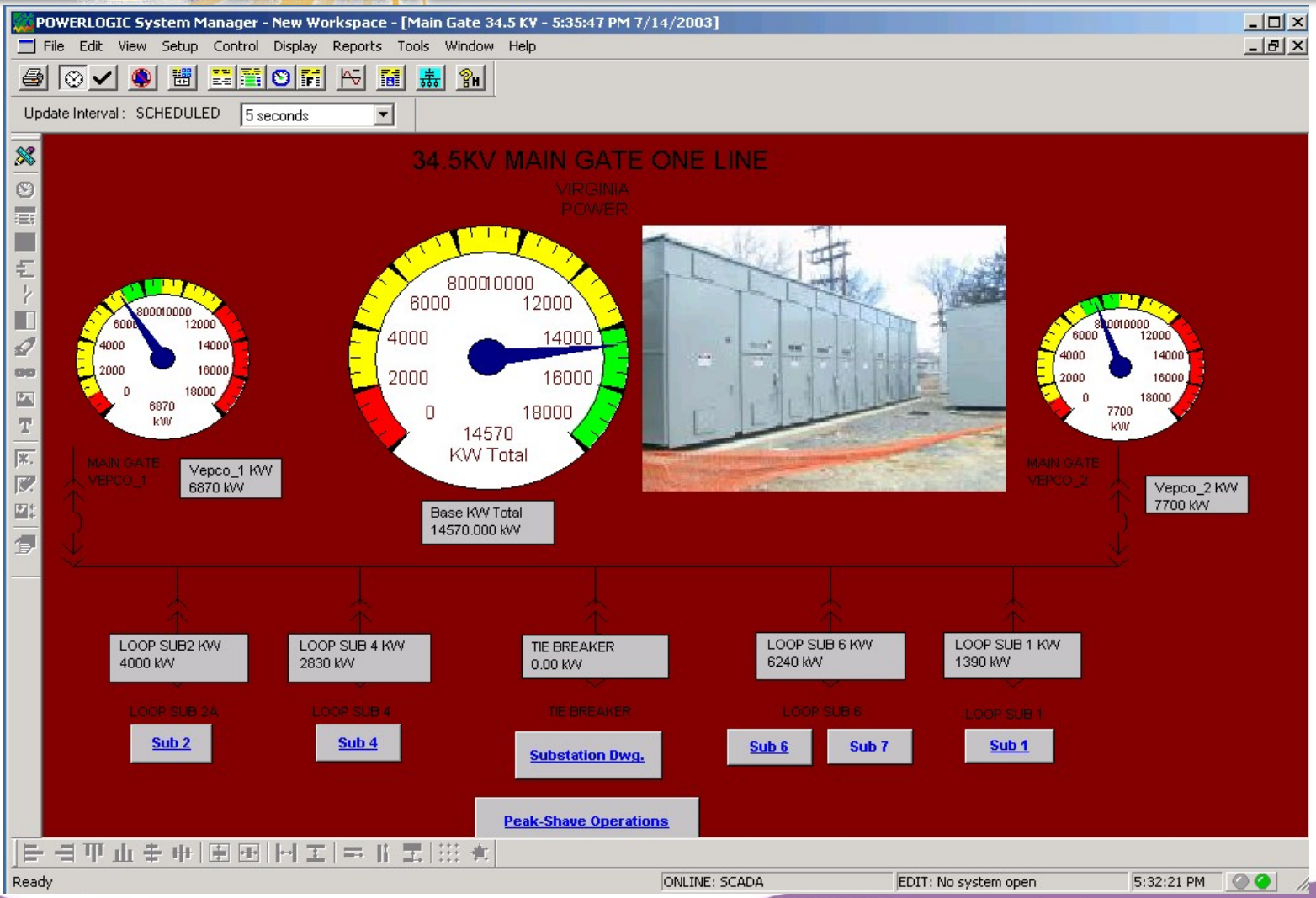
- BUILDINGS
- UTILITIES
- ROADS
- FIBEROPTIC NETWORK CABLES
- GENERATORS
- ENVIRONMENTAL DATA

Base Map: Zoom to Building

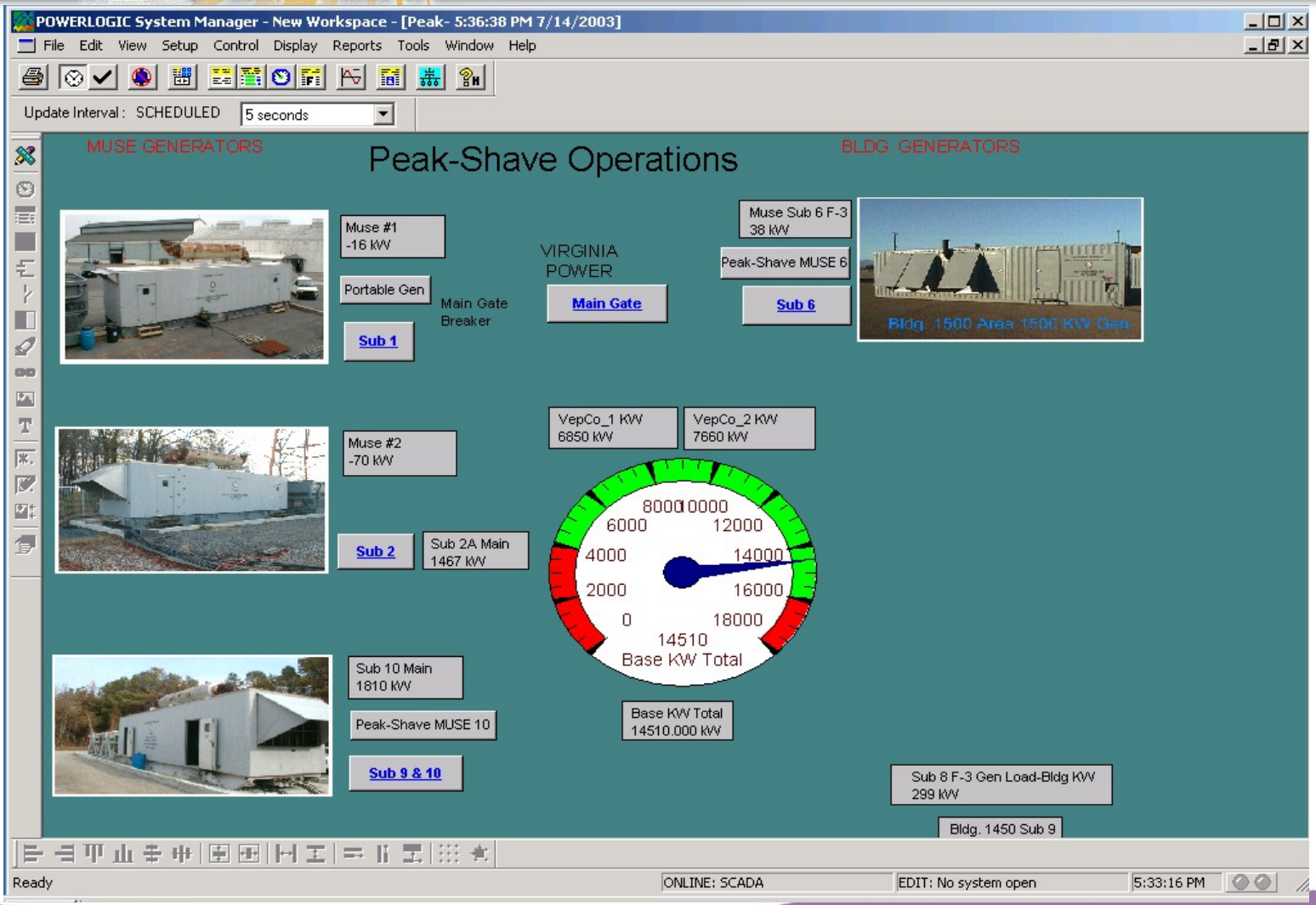


Asset Management Information

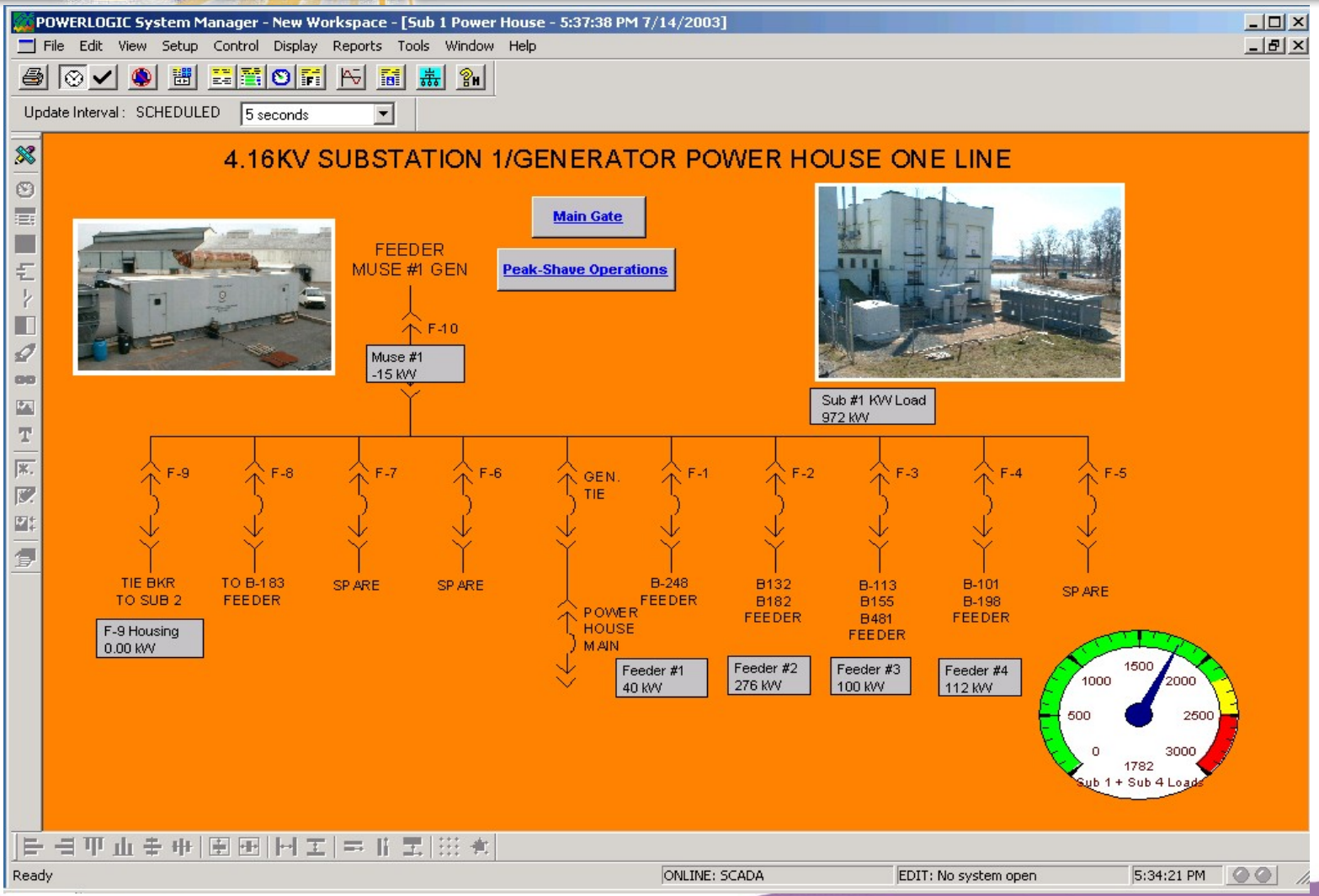
SCADA: Power Monitoring and Control



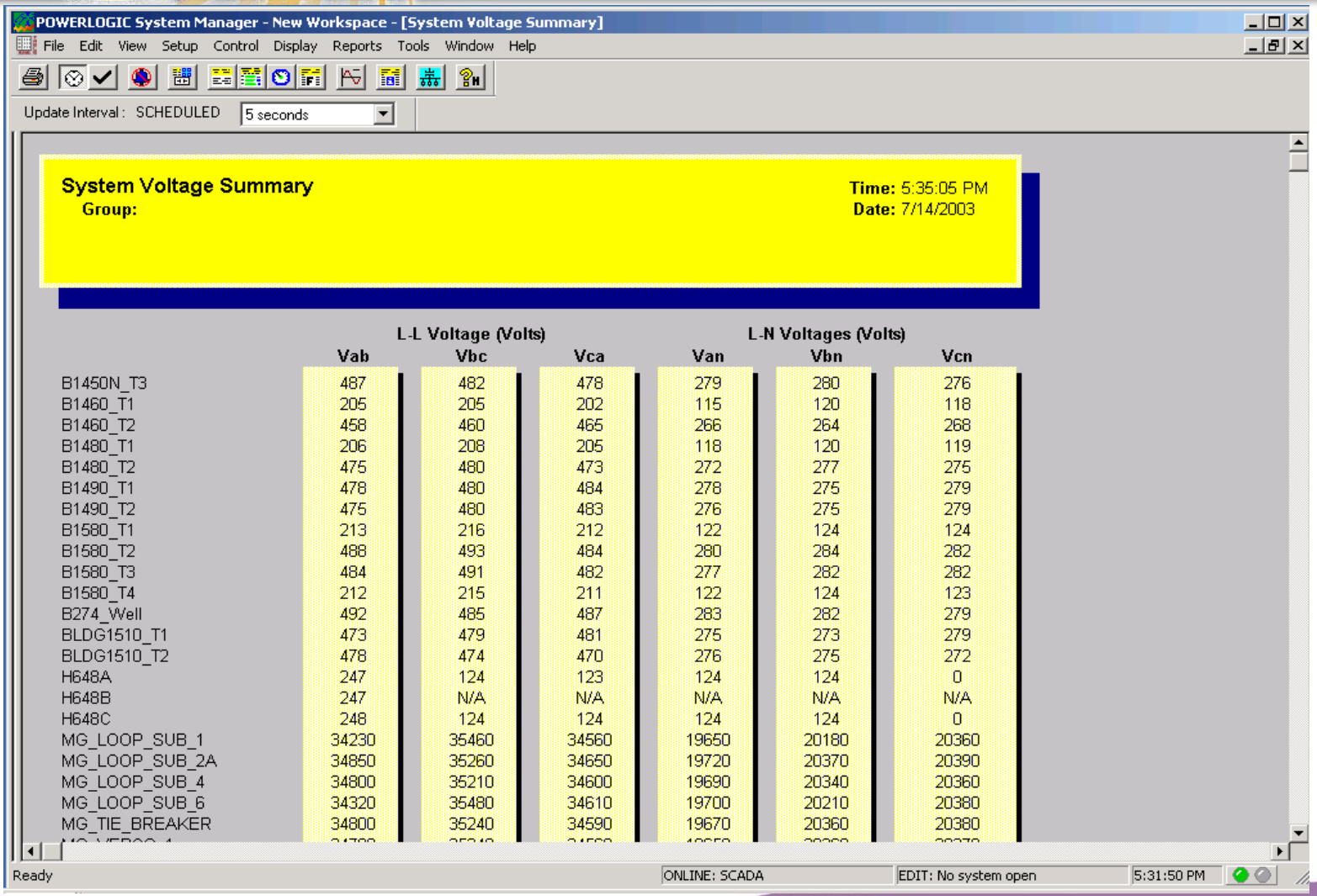
SCADA: Peak-Shave Operations



SCADA: Substation Monitoring

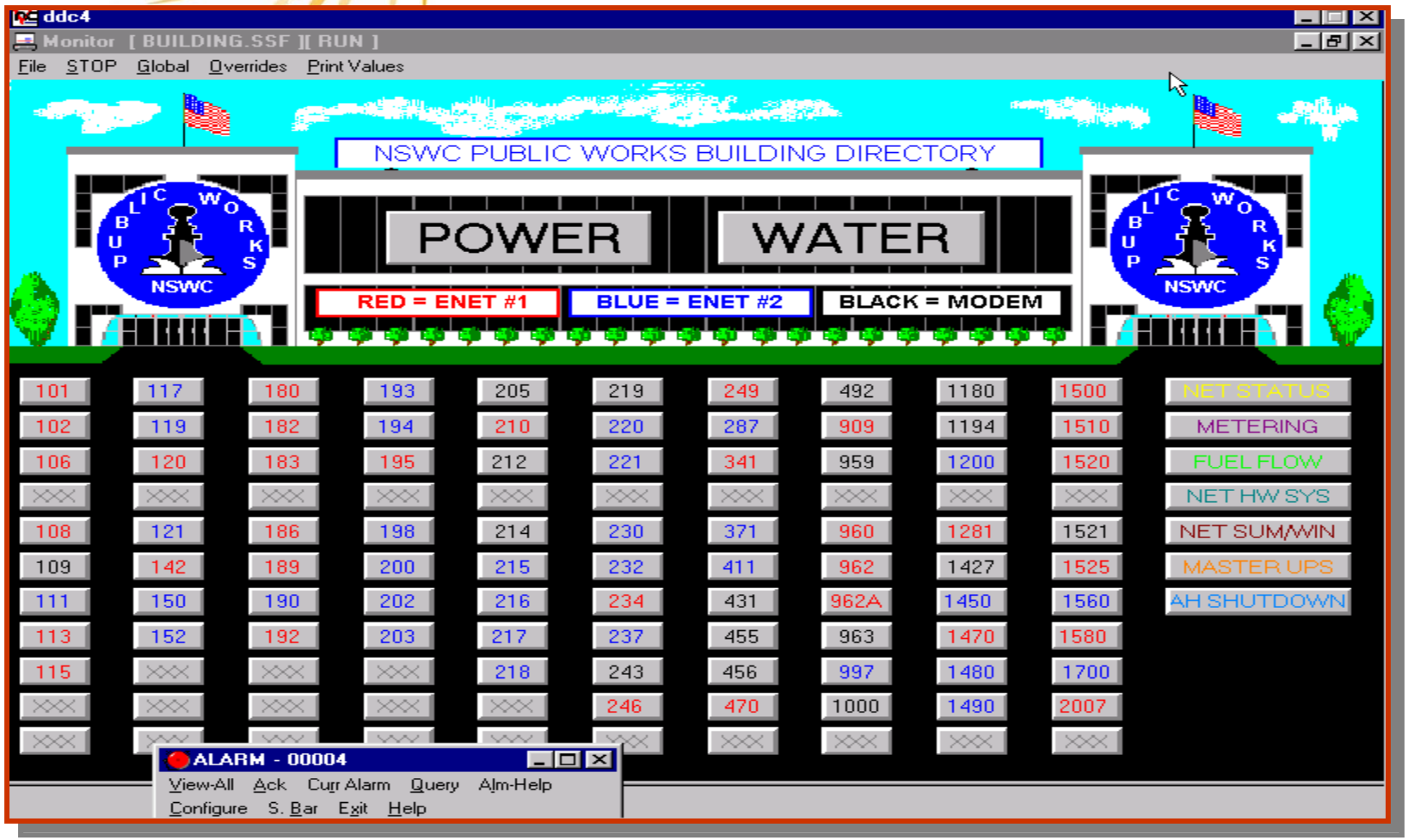


SCADA: Data Retrieval

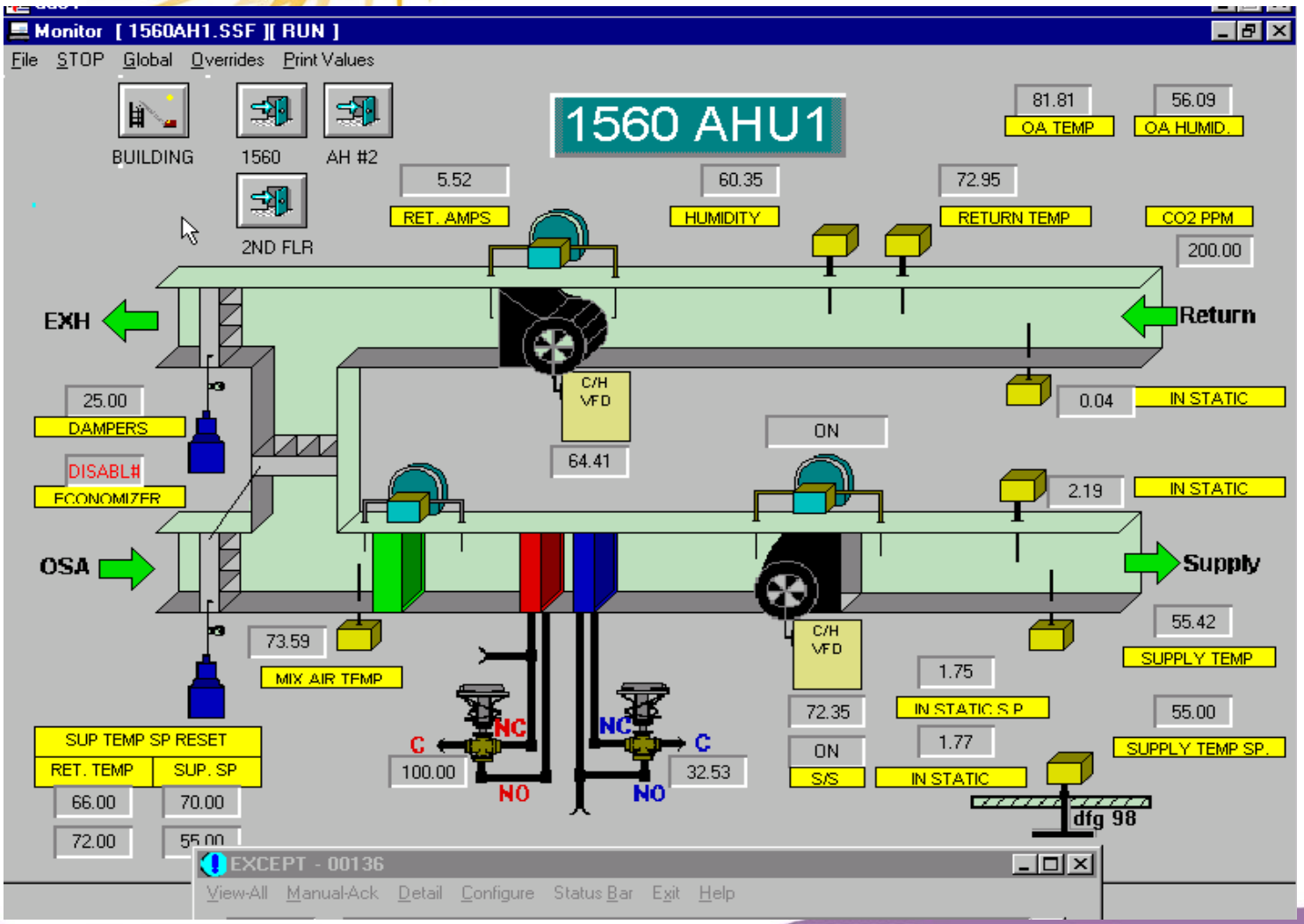


	L-L Voltage (Volts)			L-N Voltages (Volts)		
	Vab	Vbc	Vca	Van	Vbn	Vcn
B1450N_T3	487	482	478	279	280	276
B1460_T1	205	205	202	115	120	118
B1460_T2	458	460	465	266	264	268
B1480_T1	206	208	205	118	120	119
B1480_T2	475	480	473	272	277	275
B1490_T1	478	480	484	278	275	279
B1490_T2	475	480	483	276	275	279
B1580_T1	213	216	212	122	124	124
B1580_T2	488	493	484	280	284	282
B1580_T3	484	491	482	277	282	282
B1580_T4	212	215	211	122	124	123
B274_Well	492	485	487	283	282	279
BLDG1510_T1	473	479	481	275	273	279
BLDG1510_T2	478	474	470	276	275	272
H648A	247	124	123	124	124	0
H648B	247	N/A	N/A	N/A	N/A	N/A
H648C	248	124	124	124	124	0
MG_LOOP_SUB_1	34230	35460	34560	19650	20180	20360
MG_LOOP_SUB_2A	34850	35260	34650	19720	20370	20390
MG_LOOP_SUB_4	34800	35210	34600	19690	20340	20360
MG_LOOP_SUB_6	34320	35480	34610	19700	20210	20380
MG_TIE_BREAKER	34800	35240	34590	19670	20360	20380

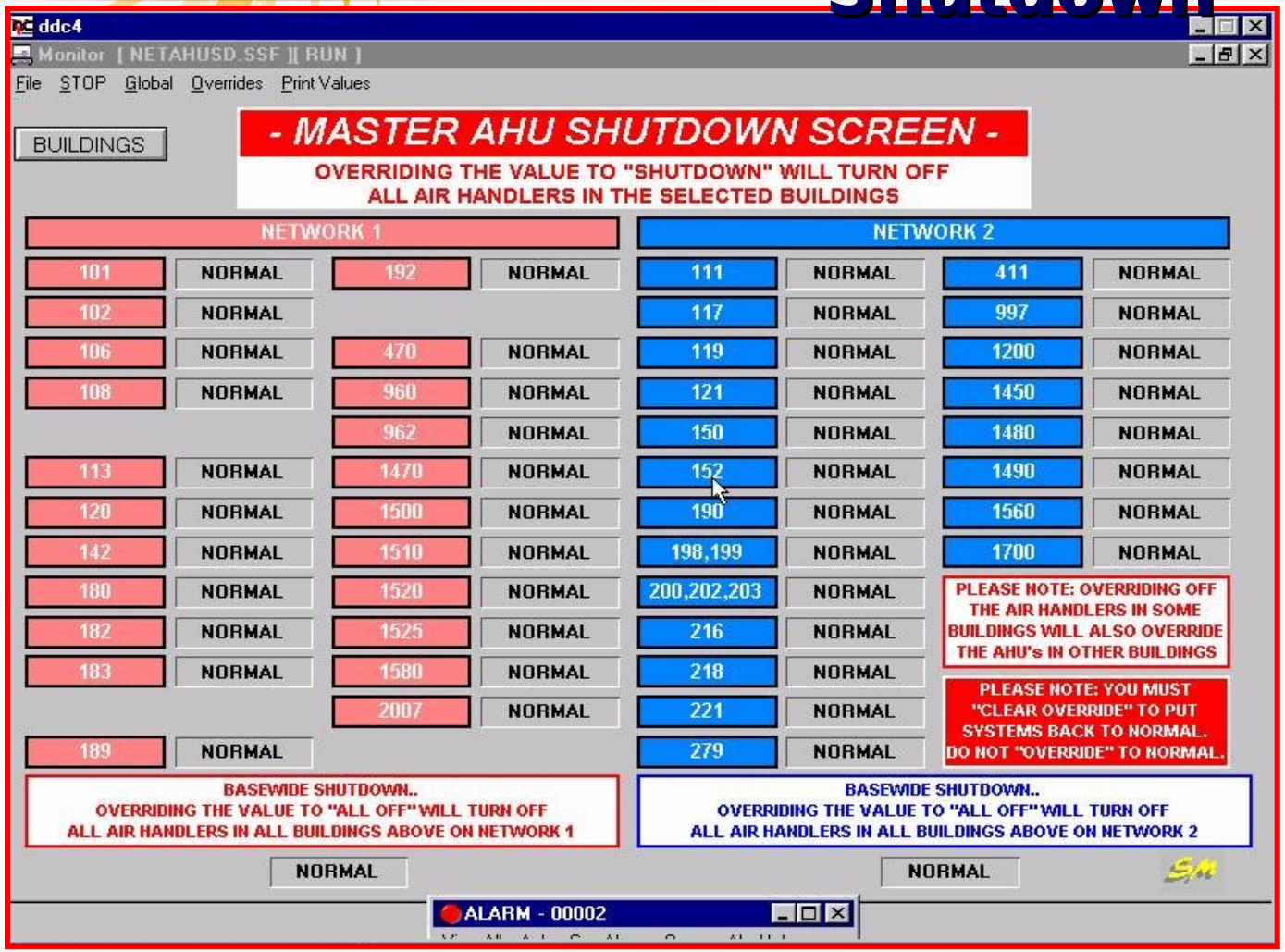
SCADA: Direct Digital Controls



Digital Controls: HVAC Applications



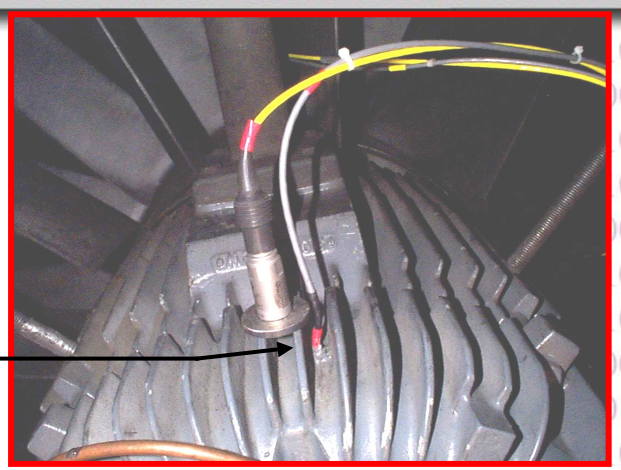
Digital Controls: Master Air Handling Unit Shutdown



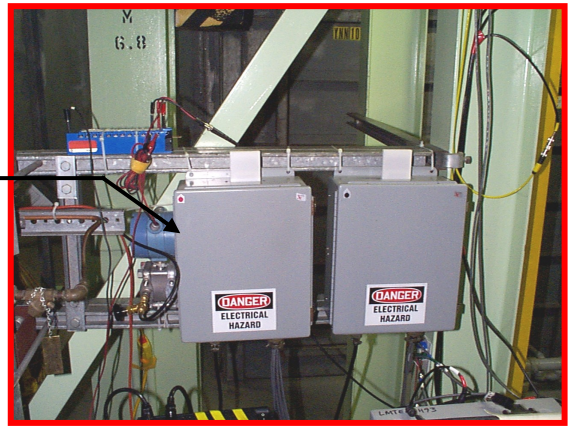
Wireless Equipment Monitoring & Control

FIPS 140-2 Secure Wireless Gateway (AES, 3DES) with GPRS, 3G, UWB Capability

Non-Intrusive Sensors for Vibration, Pressure



Secure Smart Wireless Sensor Interface with Onboard Analysis

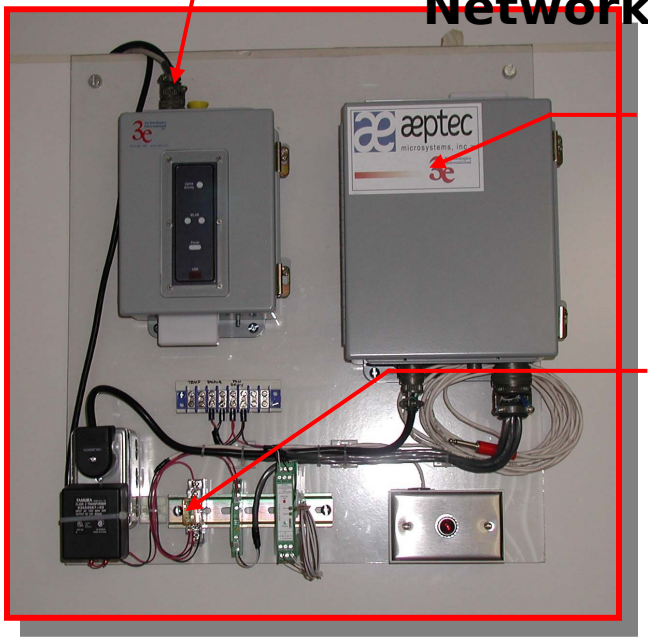


Battery Powered Bluetooth Temp Sensor

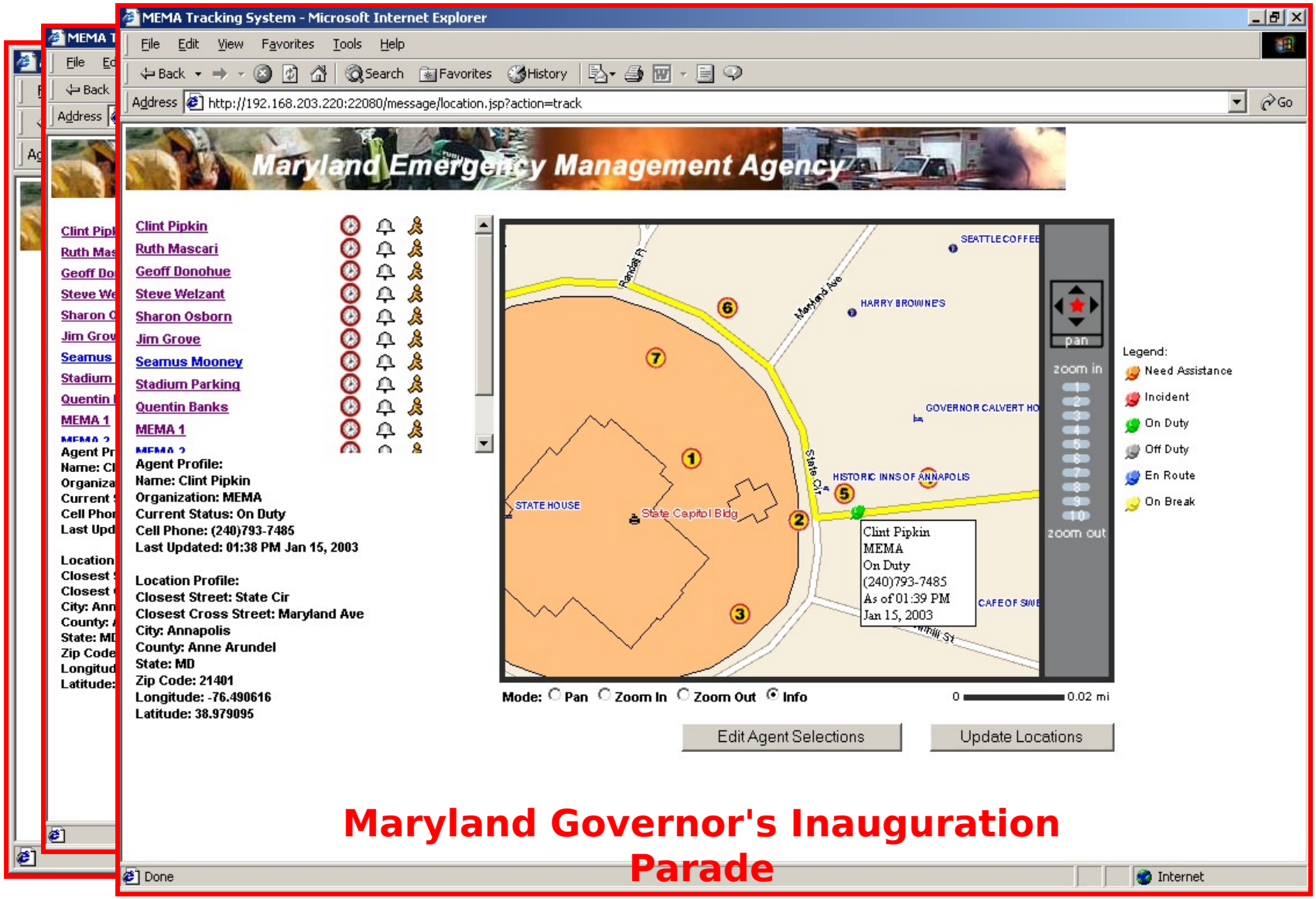
New Technologies for Emerging Threats

Wireless HVAC Control for Chem/Bio

- Chem/Bio Input Controls Building Air Flow
- Wireless Sensing & control – Dual Wireless Modes
  - Bluetooth
    - PDAs
  - 802.11b
    - High-Bandwidth Data
    - TCP/IP Protocol
    - Ad Hoc Networking
- Encryption (FIPS 140-2, AES, 3DES)
- Modular design
  - Can easily add GPRS, 3G, 802.11a/g, UWB, etc.



Asset & Personnel Tracking



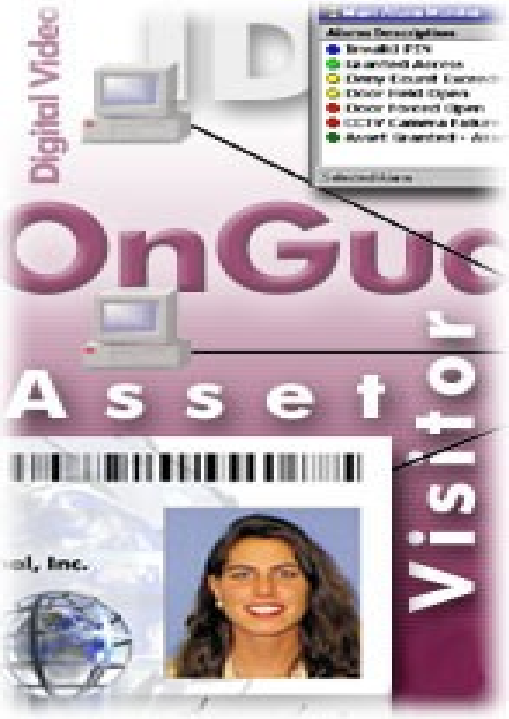
Maryland Governor's Inauguration Parade

Video Monitoring of Critical Assets

Video Surveillance of Substation #1. One of Eleven Substations on Base

Other Technology Integration

- Base Infrastructure
  - Security – Track-Badge
  - HAZMAT
  - Range Sensors
  - Fire Alarm Systems
- Other Tools…
  - Blast Effects Models (BEEM)
  - Force Protection Tools
  - NSWC Dahlgren – VLS Track Chem/Bio Mod
- Prototype “Next Generation” Emergency Operations Center



Test-Bed Implementation Approach

- **Determine Operational Requirements**
  - Determine EOC Requirements
  - Analyze & Identify Threats
  - Determine Information & Systems Requirements
  - Determine Staffing & Training Requirements
  - Determine Procedural Requirements & Organizational Interfaces
- **Determine Top-Level Design**
  - Engineer Command & Control Center
  - Develop Emergency Response Procedures
  - Engineer Sensor, Monitoring & Control System Interfaces
  - Engineer Database Information Interfaces
  - Engineer Network & Communications Infrastructure
  - Develop Integration Plan for HomeLand Defense Technologies
- **Implement Test Bed**
  - Build Capability to Assess Technology, New Procedures
  - Generate & Conduct Threat Scenarios
  - Capture & Analyze Data for Evaluation
  - Make Recommendations for Changes

Issues Related to VCEC

- 30 Sept 03 RFP to be issued for Utilities Privatization
- 1 Oct 03 Claimant Consolidation

Strategy to Overcome Issu

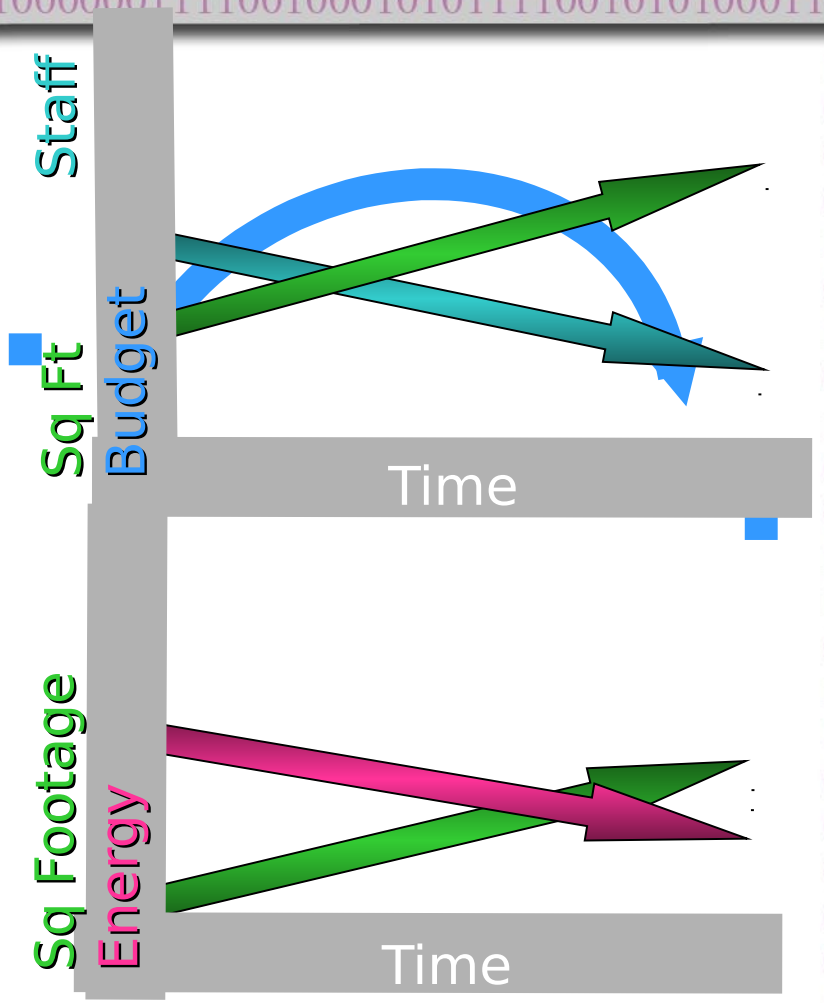
- Utilities Privatization
  - Write the RFP to Include use of existing system as a R&D test bed
  - Seek Sponsor exemption/delay due to the National Need for VCEC

- Regionalization
  - Team with Region to use base infrastructure as a test bed while improving base operations

Summary

VCEC Benefits / ROI

- Networking the existing infrastructure
- Integration of critical technologies & chemical/biological detectors
- Improvement of real-time emergency response & support
- Remotely / automatic control & monitoring of assets
- Effectively mitigate losses
- Control rising energy costs
- Maintain effective operations with declining budgets & staff



VCEC Test-bed can be Leveraged for AT/FP/HLD Applicati

Contact Information

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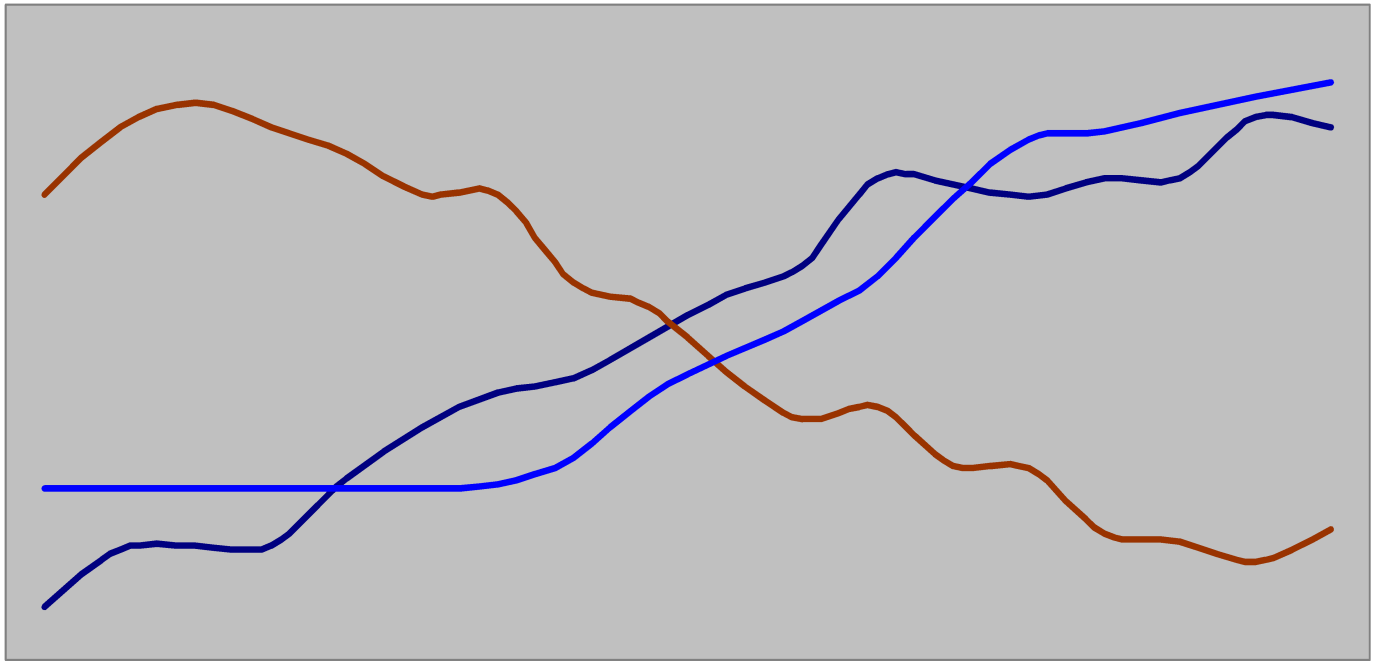
Backup

Documented Base Operations Metrics

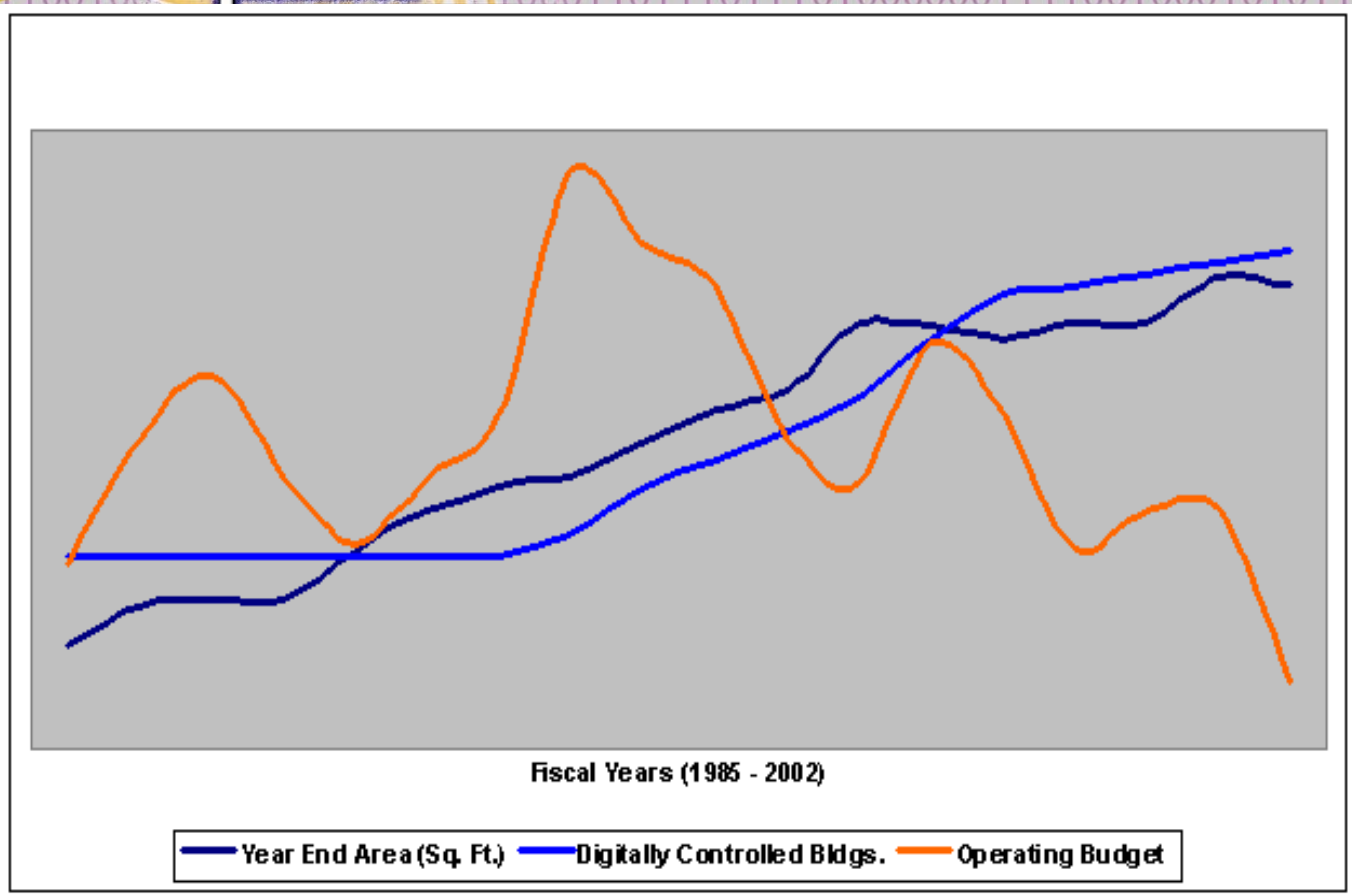


Highlights

- 38% Decline in Staff
- 77% Increase in Base Sq Ft
- Digitally Controlled Bldgs: 1 to 107
- Technology Employed to Mitigate Staffing Decline

Effective operation maintained despite decline of staff and growth in square footage

Documented Base Operations Metrics

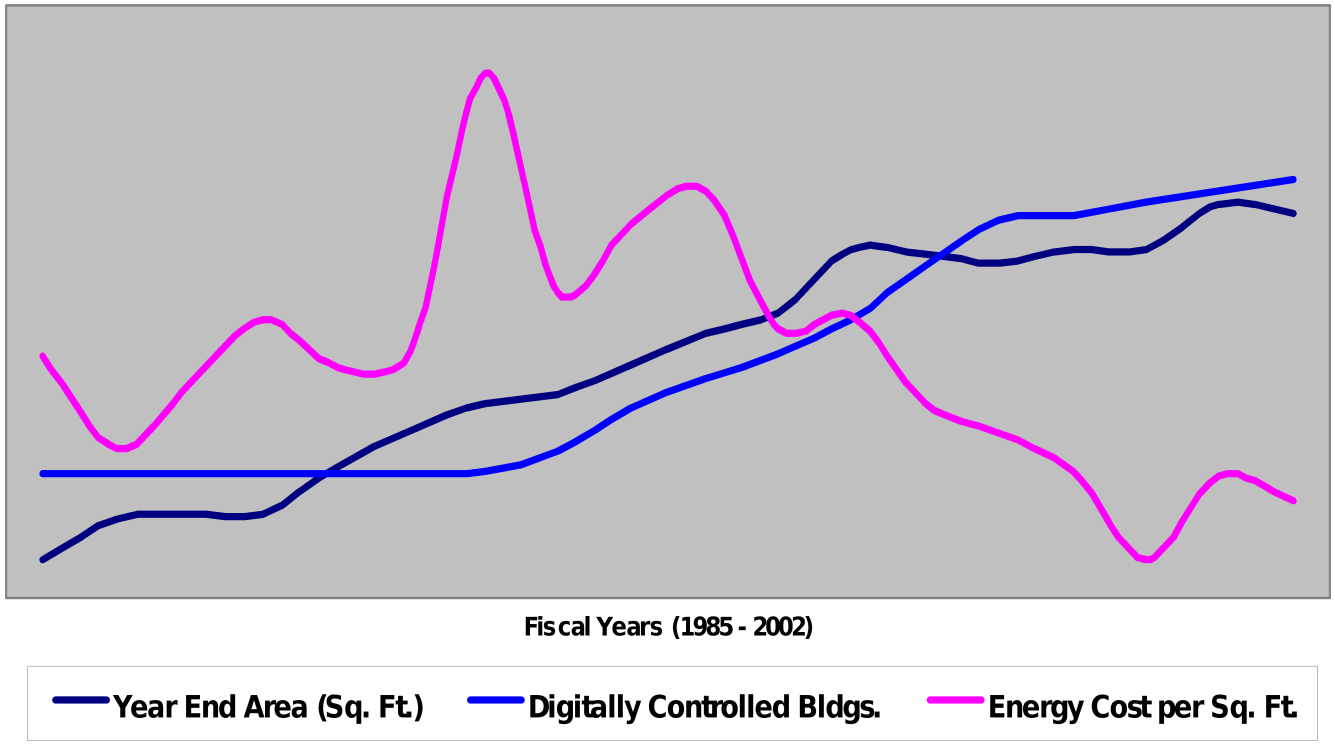


Highlights

- 77% Increase in Base Sq Ft
- 10% Recent Decline in Operating Budget
- Budget Decrease Necessitated Employment of Technology

Effective operation maintained despite decline of budget and growth in square footage

Documented Base Operations Metrics



Highlights

- 13% Drop in Energy Cost per Sq. Ft.
- 77% Increase in Base Sq Ft
- Digitally Controlled Bldgs: 1 to 107
- Technology Employment Resulted in Reduction in Energy Usage

Effective operation maintained despite decline of budget & staff and growth in square footage

High-Level Visibility

- U. S. Senate Officials visit VCEC
- Senior Navy Officials visit VCEC
- Senior NAVFAC Officials visit VCEC
- State Delegation visits VCEC
- Other Navy Sites Request VCEC Capability
  - Request to integrate remote monitoring of Washington Navy Yard
  - Request to provide VCEC technologies at NSWC IH